Lecture 0

Introduction

The Goal of CS 1130

- Acquire competency in basic Java
  - Leverage previous programming experience
  - Focus on the aspects that (might be) new
- Acquire competency in OO programming
  - The concepts extend beyond Java
  - Lots of OO languages (Python, Objective-C…)
- This course is for students who took old 1112
  - **Freshmen do not need to take this course**

Course Structure

- Hands on labs every Wednesday
  - Designed for quick feedback on your progress
  - Go to **any lab you want** or **none at all**
  - But you must do the lab and show it to someone
  - Can submit during Consultant hours if you want
- Three assignments
  - Two programming, one written
  - Keep revising assignments until you pass
- No final exam!

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Everything is pass/fail
Just have to keep up with deadlines

Outside of Class

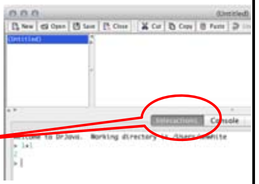
- **Course Web page**
  - http://www.cs.cornell.edu/courses/cs1130
  - All assignments and labs are posted
  - Welcome to finish them all early
- **Course Management System**
  - Where to submit assignments, receive feedback
  - http://cms.csuglab.cornell.edu
  - Not on CMS? E-mail ccf27@cornell.edu

Outside of Class

- **Sign up for Piazza**
  - Online discussion forum for students
  - Questions can be answered by anyone
  - Faster than waiting for an e-mail response
- **Consultant Hours**
  - Sunday-Thursday 4:30-9:30 in ACCEL Labs
  - There to help CS 1110 AND CS 1130
  - Some extra hours near CS 1110 deadlines
  - Can turn in your labs at this time

DrJava: An IDE for Java

- **IDE:** Integrated Development Environment
  - Makes programming easier
  - Other IDEs: Eclipse, NetBeans
- Analogy: Web Design Tools
  - Could just write pure HTML
  - But design tools make easier
- **DrJava:** Interactions pane
  - Works like a calculator
  - Allows us to get started quickly
  - But you still have to understand **types**



Java is a Strongly Typed Language

- **Type: A set of values and the operations on them.**
  - Examples of operations: +, -, /, *
  - The meaning of these depends on the type
- Type **int**:
  - values: …, –3, –2, –1, 0, 1, 2, 3, 4, 5, …

    "Whole" numbers w/o decimals
  - operations: +, –, *, /, unary –

    multiply
  - **Principal**: operations on int values must yield an int
  - **Example:** 1 / 2 rounds result down to 0

Java is a Strongly Typed Language

- **Type: A set of values and the operations on them.**
  - Examples of operations: +, -, /, *
  - The meaning of these depends on the type
- Type **int**: a **FINITE** set of integers
  - values: –2147483648, –2147483647, …, –3, –2, –1, 0, 1, 2, 3, 4, 5, …, 2147483646, 2147483647
  - operations: +, –, *, /, unary –

    multiply
  - **Bounds:** Integer.MIN_VALUE, Integer.MAX_VALUE

Type: Set of values and the operations on them

- Type **double**:
  - values: Numbers in scientific notation, e.g.

    2.0 22.3 $\underbrace{22.51}_{\text{mantissa}}E\underbrace{–6}_{\text{exponent}}$ (same as 0.00002251)
  - operations: +, –, *, /, unary –
    - 1.0/2.0 is 0.5 not 0. Operation / behaves *differently* for **double**
- An **approximation** to the real numbers
  - Again, Java cannot represent them all
  - Double.MIN_VALUE 4.9E-324 — **Smallest POSITIVE value**
  - Double.MAX_VALUE 1.7976931348623157E308

Casting: Converting Value Types

- Basic form: (*type*)*value*
  - **(double)** 2 casts 2 to type **double**. Value is 2.0

    Widening cast. Java does it automatically if needed
  - **(int)** 2.56 casts 2.56 to type **int**. Value is 2

    Narrowing cast. Java *never* does it automatically because it might lose information.
- Narrow to wide: **int** ⇒ **long** ⇒ **float** ⇒ **double**
- Other examples:
  - **(double)(int)** 2.56 Value is 2.0
  - **(double)** 2.56 Value is 2.56